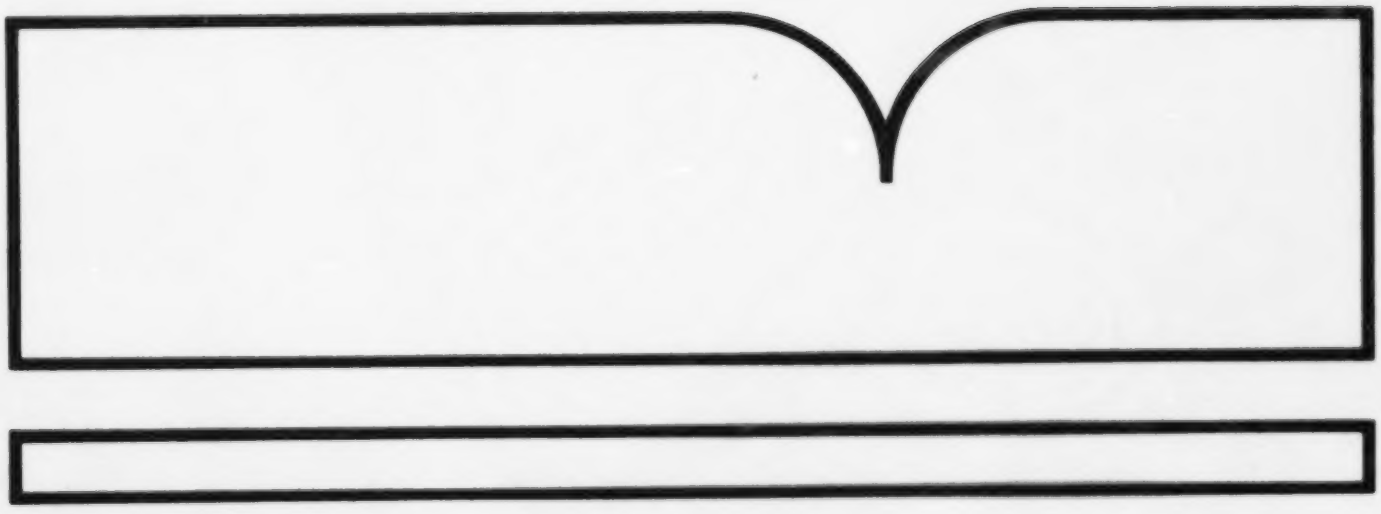
PB87-189056

Superfund Record of Decision (EPA Region 10) United Chrome Products, Corvallis, Oregon

(U.S.) Environmental Protection Agency
Washington, DC

Sep 86



U.S. Department of Commerce
National Technical Information Service
NTIS

TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO. EPA/ROD/R10-86/008	2.	3. RECIPIENT'S ACCESSION NO PB87 189056/AS
4. TITLE AND SUBTITLE SUPERFUND RECORD OF DECISION United Chrome, OR		5. REPORT DATE September 12, 1986
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO
9. PERFORMING ORGANIZATION NAME AND ADDRESS Same as box 12.		10. PROGRAM ELEMENT NO
		11. CONTRACT/GRANT NO
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460		13. TYPE OF REPORT AND PERIOD COVERED Final ROD Report
		14. SPONSORING AGENCY CODE 800/00
15. SUPPLEMENTARY NOTES		

16. ABSTRACT

The United Chrome Products (UCP) site is a former industrial hard chrome plating facility located in Corvallis, Oregon. UCP began electroplating operations in 1956. Between 1956 and 1975 an onsite dry well was used to dispose of floor drippings, washings, and product rinsate collected in a sump within the building. The liquids were reportedly neutralized with sodium hydroxide and/or soda ash prior to disposal. Use of the dry well was discontinued in 1975. As a result of the immediate removal action, to stabilize the site, all hazardous substance source materials have been removed with the exception of residual sludges in the bottom of the plating tanks. However, there is considerable chromium contamination in the soil beneath and around the building and in the upper and lower aquifers as a result of leaching from the dry well and plating tanks.

The selected remedial action for this site includes: installation of approximately 15 shallow wells in the upper confined ground water zone; installation of 5 deep wells in the lower confined production aquifer; limited excavation of contaminated soil and offsite disposal; installation of onsite treatment equipment (chemical reduction and precipitation) to remove chromium from extracted ground water; construction of two percolation basins to flush soil; and installation of culverts. Estimated capital cost for the selected remedial alternative is $1,580,000 and the annual O&M costs are approximately $261,000.

17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision United Chrome, OR Contaminated Media: gw, soil Key contaminants: chromium		
18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (This Report) None	21. NO. OF PAGES 41
	20. SECURITY CLASS (This page) None	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R10-86/008
September 1986

PB87-189056

EPA

Superfund Record of Decision:

United Chrome, OR

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA 22161

Record of Decision

Remedial Alternative Selection

SITE

United Chrome Products, Corvallis, Oregon

DOCUMENTS REVIEWED

The following documents describing the analysis of the cost-effectiveness of remedial alternatives for the United Chrome Products Site provide the primary basis for this decision:

- Final Remedial Investigation Report, Volumes 1 and 2, July 26, 1985.
- Public Comment Feasibility Study, August 19, 1985.
- Summary of Remedial Alternative Selection.
- Responsiveness Summary.

DESCRIPTION OF SELECTED REMEDY

- Installation of approximately 15 shallow wells (15 to 20 feet) to extract chromium-contaminated groundwater in the upper unconfined groundwater zone.
- Installation of approximately 5 deep wells (35 to 40 feet) to extract chromium-contaminated groundwater in the lower confined, production aquifer.
- Installation of on-site treatment equipment (chemical reduction and precipitation) to remove chromium contamination from extracted groundwater prior to discharge to Muddy Creek or city of Corvallis Wastewater Treatment Facility.
- Construction of two percolation basins in the areas of the former dry well and plating tanks to flush the contaminated soil above the shallow groundwater table. Approximately 350 tons of contaminated soil excavated during the construction of these basins would be disposed of at a permitted land disposal facility.
- Installation of culverts in the adjacent open drainage ditch to isolate the surface drainage system from the inflow of contaminated surface water and groundwater from the site.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that the foregoing Description of Selected Remedy at the United Chrome Products site is cost-effective and provides adequate protection of public health, welfare, and the environment. The state of Oregon has been consulted and agrees with the approved remedy. In addition, the action will require future operation and maintenance activities to ensure the continued effectiveness of the remedy. These activities will be considered part of the approved action and eligible for Trust Fund monies for a period not to exceed one year.

All off-site disposal shall be in compliance with the policies stated in the Procedure for Planning and Implementing Off-Site Response Actions (Federal Register, Vol. 50 Number 214, November 5, 1985, pages 45933 - 45937). In addition, I have determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites. The implementation of the selected remedy is more cost effective than other remedial actions and is necessary to protect public health, welfare, and the environment.

Robie G. Russell
Regional Administrator

9-12-86
Date

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

UNITED CHROME PRODUCTS

SITE LOCATION AND DESCRIPTION

The United Chrome Products (UCP) site is a former industrial hard chrome plating facility located at 2000 Airport Road in the Airport Research Industrial Park complex. The airport is located approximately 3.5 miles south of the city of Corvallis (1980 population, 42,000) in Benton County, Oregon. The UCP site consists of a single building on approximately 1.5 acres of level ground and is bounded by the Corvallis Airport. All of the property around the site including UCP is owned by the city of Corvallis (Figure 1).

Surface water runoff from the site drains into an open ditch along the northern edge of the facility. This ditch drains into Dry Creek, approximately 1.5 miles to the east. Dry Creek drains into the West Fork of the Booneville Slough and finally into the Willamette River. The Willamette River is a primary source of drinking water for the city of Corvallis.

The local subsurface environment at the UCP site is characterized by two saturated zones. The upper unconfined zone consists primarily of clayey silt alluvium with a saturated thickness of 15 to 18 feet during winter months and decreasing during the summer. During the winter the saturated zone often reaches the ground surface. The lower confined aquifer ranges at depths from 29 to 45 feet below the ground surface. This aquifer provides water for the airport complex and nearby businesses and residences. There is a silty clay unit separating the two saturated zones at a depth of about 17 to 21 feet below ground surface.

SITE HISTORY

UCP began electroplating operations in 1956. The dry well disposal pit was created in the same year by removing approximately 3 feet of native soil in the area west of the building and backfilling with sand and gravel. Between 1956 and 1975 the dry well was reportedly used to dispose only of floor drippings, washings, and product rinsate collected in a sump within the building. The liquids were reportedly neutralized with sodium hydroxide and/or soda ash prior to disposal in the dry well. Quantities of waste discharged are unknown, but were estimated by the facility operator to be approximately 1,000 gallons per year. In 1975, use of the dry well was reportedly stopped. The amount and disposition of wastes produced since then is unknown.

The specific composition of wastes discharged to the dry well are also unknown; however, the nature of the facility indicates that one or more of the following general waste streams may have been involved:

- Spent plating bath solutions
- Spent stripping and cleaning bath solutions
- Sludges from the bottom of plating baths

Reproduced from
best available copy.

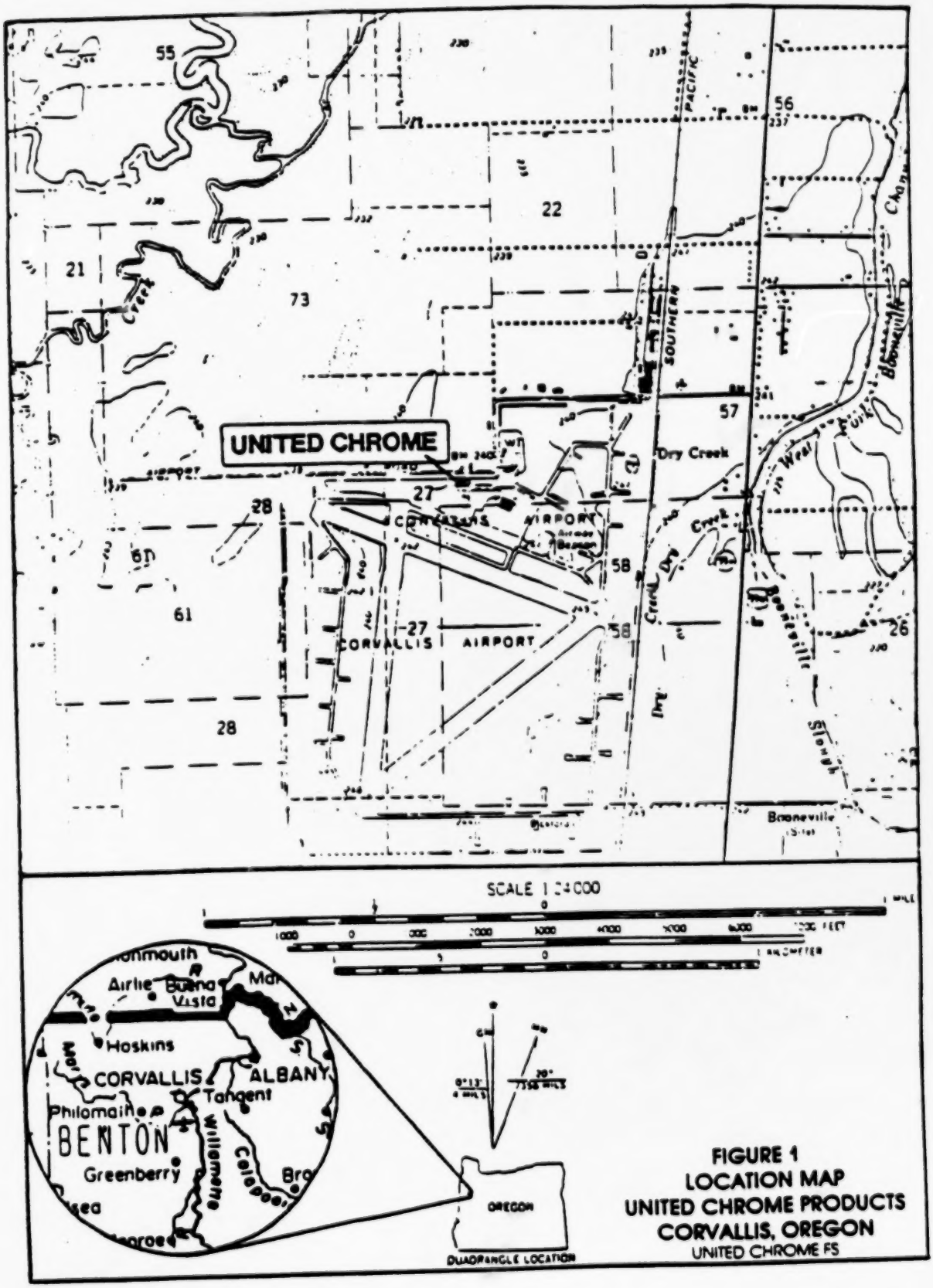


FIGURE 1
LOCATION MAP
UNITED CHROME PRODUCTS
CORVALLIS, OREGON
UNITED CHROME FS

The facility operator has stated that the contents of plating bath tanks were not disposed of in the dry well. Instead, plating solutions were recycled by allowing impurities to settle, and adding additional chromium as needed to rejuvenate the bath. In 1982, accumulated sludges were removed from the tanks and disposed of under Oregon Department of Environmental Quality (ODEQ) guidance.

In November 1984, UCP announced that it would shut down and cease all operations by early 1985. In May 1985, the equipment and contents of the building were sold at auction. The building is currently vacant. The city of Corvallis has indicated that it presently has no plans for alternative use of the site area and building, or for demolition of the facility.

An immediate removal action was initiated in July 1985 to stabilize the site after the company vacated the building. An eight-foot chain link fence was installed around the perimeter of the site and approximately 6,300 gallons of spent plating solution and 114 drums and containers were removed. These activities were completed in October 1985. A chronological list of the investigations conducted at UCP is presented in Table 1.

CURRENT SITE STATUS

As a result of the immediate removal action completed in October 1985, all hazardous substance source materials have been removed from the site with the exception of the residual sludges in the bottom of the plating tanks. However, there is still considerable chromium contamination in the soil beneath and around the building and in both the upper and lower aquifers, as a result of leaching from the dry well and plating tanks (Figure 2).

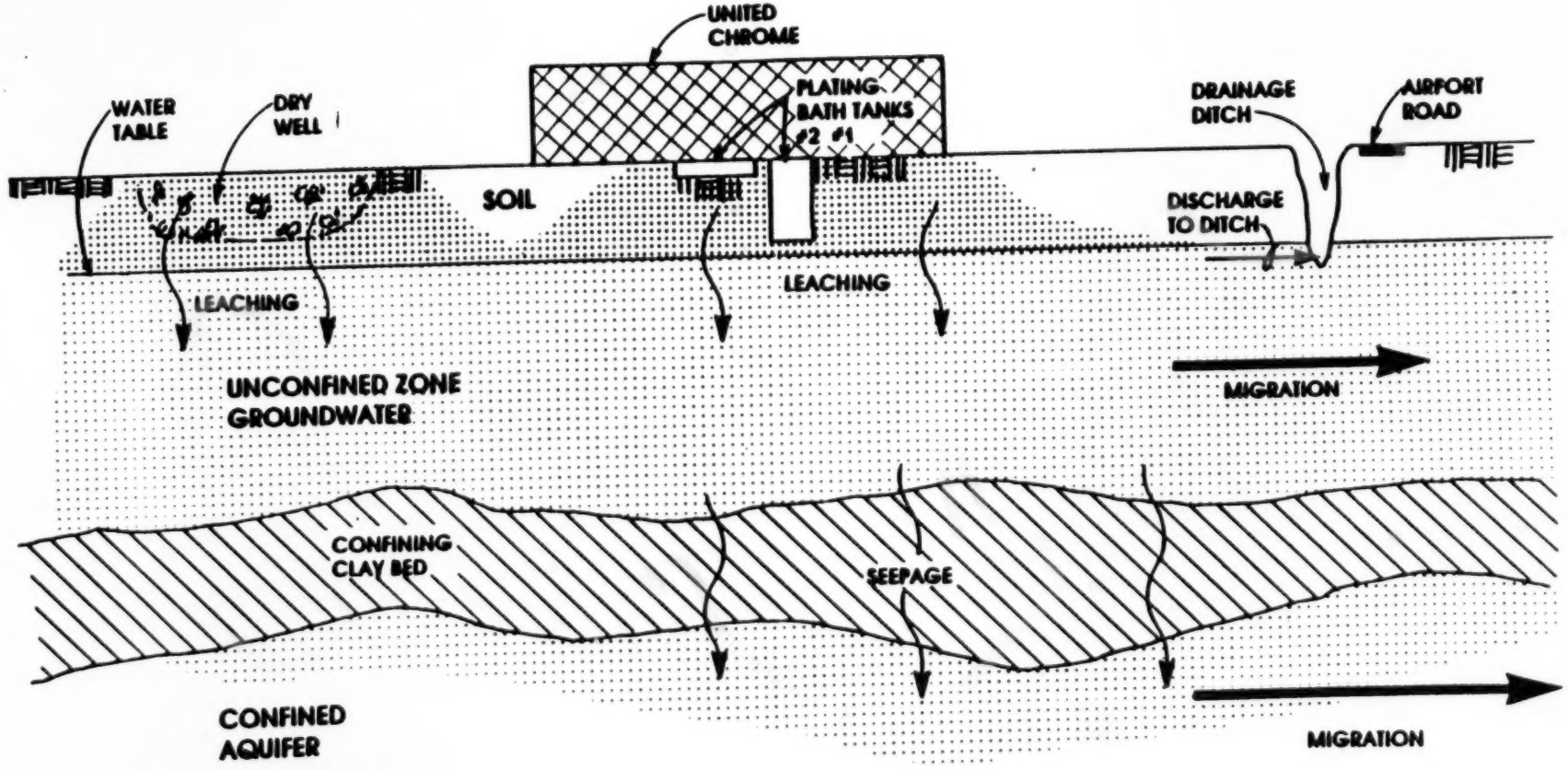
The estimated lateral extent of contamination in the upper and lower zones are shown in Figures 3 and 4 respectively. The total volume of contaminated groundwater in both zones is estimated to be 2.4 million gallons. The chromium concentrations (total chromium) in the upper zone are as high as 1.5 per cent near the plating tanks with concentrations in the surrounding monitoring wells ranging from 142 to 689 milligrams per liter (mg/l). Concentrations in the lower zone are generally an order of magnitude lower; however, the primary drinking water standard of 0.05 mg/l has been exceeded in numerous deep well samples.

The nearest potential receptors for the contaminated groundwater are the city of Corvallis' two production wells approximately 3,000 feet downgradient from the UCP site. These wells serve the airport complex. In addition, the nearby open drainage ditch continues to receive contaminated surface runoff and shallow groundwater infiltration.

TABLE 1

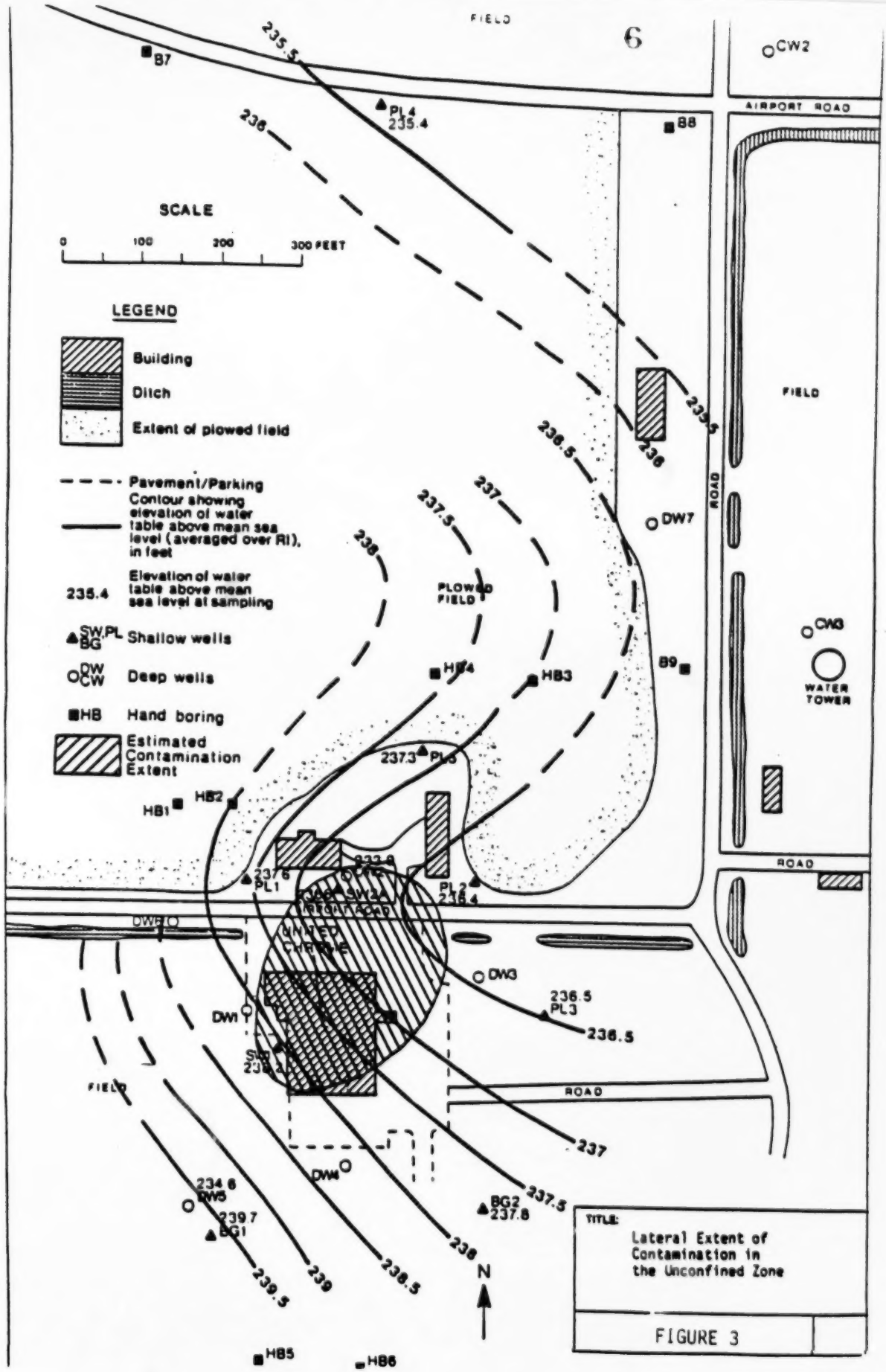
INVESTIGATIONS AT UNITED CHROME PRODUCTS SITE

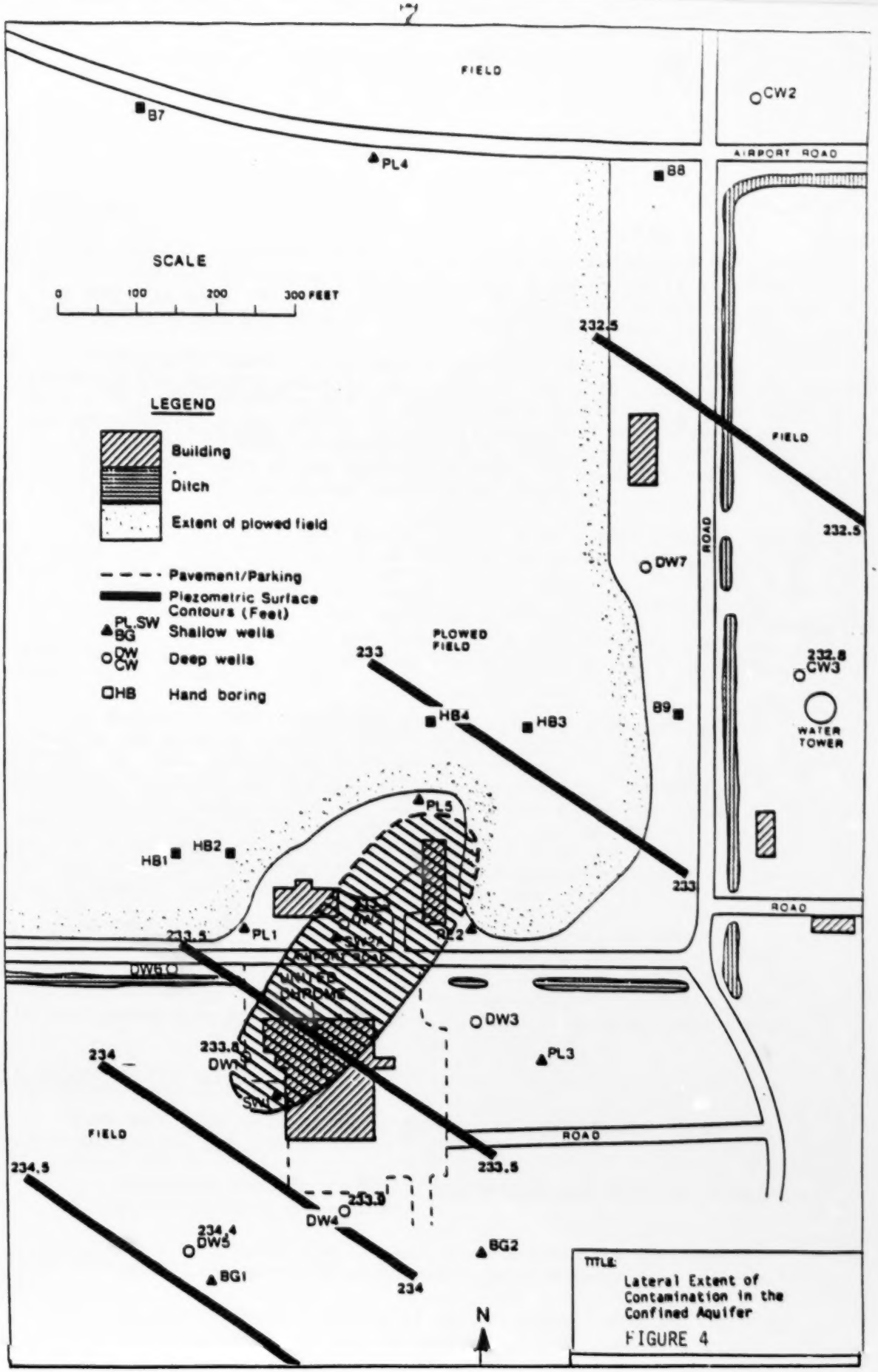
Principal Investigator	Date of Investigation	Purpose of Investigation	Summary of Results
Oregon Department of Environmental Quality (DEQ)	Nov. 1982	Sample 2 City of Corvallis wells and 2 domestic wells	No evidence of chromium contamination (<0.002 mg/L total Cr)
DEQ	Dec. 1982	Sample surface discharge by dry well	Elevated levels of chromium (4.2 mg/L total Cr)
DEQ	Jan. 1983	Sample sediment in Booneville Slough	Elevated levels of chromium (0.06 mg/L total Cr)
		Sample United Chrome ditch sediment	Elevated levels of chromium (410 mg/kg total Cr)
		Sample United Chrome dry well sediment	21,000 mg/kg total Cr
EPA (E&E)	June 1983	Install and sample 4 shallow wells in dry well area	Up to 3,619 mg/L dissolved Cr in groundwater; soil classified as hazardous waste
		Install and sample 5 deep wells around perimeter of facility	Up to 3.0 mg/L dissolved Cr in groundwater
		Sample local drainage network	Up to 10.5 mg/L dissolved Cr in surface water and 4.3 mg/L total Cr in sediment leachate
DEQ	June 1983	Sample runoff and sludge by dry well	Elevated levels of Cr, operator ordered to remove sludge
EPA (E&E)	July 1983	Hazard ranking system score of site	HRS score = 31.7
EPA (E&E)	Jan. 1984	Resample existing monitoring wells	Chromium concentration in 2 deep wells increased significantly (to 29.9 mg/L and 24.8 mg/L compared with June 1983 results)
EPA (Corvallis Environmental Research Lab)	Feb. 1984	Aquatic and terrestrial bioassays on soil, sediment, groundwater, and surface water	Not released
EPA (E&E)	Feb. 1984	Reconstruct 3 deep wells, install one additional shallow well north of the site	New shallow well contaminated (302 mg/L total Cr)
DEQ	Oct. 1984	Sample runoff from dry well and United Chrome ditch	Elevated levels of Cr resulting in a civil penalty against facility operator
EPA (E&E)	Dec. 1984-Feb. 1985	Remedial investigation	Discussed in Volume I of 2-volume Remedial Investigation Report
EPA (Corvallis Environmental Research Lab)	Dec. 1984	Aquatic and terrestrial bioassays on groundwater from wells constructed during RI	Not released



NOTE: Section taken along axis of contaminant plume

FIGURE 2


FIELD
B7
235.5
PL4
235.4
236
B8
CW2
AIRPORT ROAD
SCALE
0 100 200 300 FEET
LEGEND
Building
Ditch
Extent of plowed field
Pavement/Parking
Contour showing elevation of water table above mean sea level (averaged over RI), in feet
235.4 Elevation of water table above mean sea level at sampling
SW,PL BG Shallow wells
DW CW Deep wells
HB Hand boring
Estimated Contamination Extent
236.5
237
237.5
238
PLOWED FIELD
DW7
ROAD
FIELD
CW3
WATER TOWER
B9
HB4
HB3
237.3 PL5
HB1
HB2
237.6 PL1
PL2 236.4
DW2
DW3
236.5 PL3
236.5
DW1
SW2A 236.4
FIELD
ROAD
237
DW4
234.6 DW5
239.7 BG1
237.5
BG2 237.8
239.5
239
238.5
238
N
HB5
HB6
TITLE:
Lateral Extent of Contamination in the Unconfined Zone
FIGURE 3


FIELD
CW2
B7
PL4
AIRPORT ROAD
B8
SCALE
0 100 200 300 FEET
232.5
LEGEND
Building
Ditch
Extent of plowed field
Pavement/Parking
Piezometric Surface Contours (Feet)
PL,SW BG Shallow wells
DW CW Deep wells
HB Hand boring
FIELD
232.5
ROAD
DW7
PLOWED FIELD
233
HB4
HB3
B9
232.8 CW3
WATER TOWER
PL5
HB1
HB2
233
ROAD
233.5
PL1
SW2
PL2
AIRPORT ROAD
UNLINED CHROME
DW5
DW3
PL3
234
233.8
DW1
SW1
FIELD
ROAD
234.5
233.5
233.8
DW4
234.4
DW5
BG2
BG1
234
N
TITLE:
Lateral Extent of Contamination in the Confined Aquifer
FIGURE 4

ENFORCEMENT

On July 13, 1983, ODEQ sent a Notice of Violation (NOV) to UCP citing unlawful disposal of hazardous waste and unpermitted discharge of wastes into public waters. This NOV directed UCP to remove the chrome sludge from the dry well area and dispose of it in accordance with state regulations.

A subsequent inspection by ODEQ on July 22, 1983, revealed that no cleanup action had been taken by UCP. In response, ODEQ issued a second NOV on July 27, 1983, requiring UCP to register as a hazardous waste generator and again directing the company to properly dispose of the chrome sludge. By the September 7, 1983, inspection by ODEQ, the sludge had been removed from the dry well area by the company and placed in drums which were later disposed of at a RCRA-permitted land disposal facility.

On January 18, 1984, ODEQ sent a letter to UCP summarizing the results of EPA's 1983 field investigation at the site and directing the company to evaluate its operating practices and to make all necessary improvements by July 15, 1984. In response, UCP retained a consultant to evaluate its operation, and on June 22, 1984, submitted a proposal to ODEQ for upgrading the company's chrome handling practices. Final design was to have been submitted by August 30, 1984, and construction of containment facilities completed by October 15, 1984.

An October 4, 1984, inspection by ODEQ revealed that UCP was still allowing contaminated runoff to discharge into public waters. On January 10, 1985, ODEQ issued a Notice of Assessment of Civil Penalties for continued violations and for UCP failing to initiate any improvements to its operation. The company appealed this order but in early 1985 ceased operation. In May of that year it auctioned off the equipment to pay a portion of some $350,000 in outstanding debts. While the company did not declare bankruptcy, there are clearly no funds available from the company to pay for any of the remedial activities at the site.

The UCP building and property are owned by the city of Corvallis. Because the city was not the operator at the site, no enforcement action is being considered at this time. The reauthorization of Superfund will likely include some changes from the present law regarding publicly-owned sites. EPA will reevaluate possible enforcement activities after reauthorization.

ALTERNATIVES EVALUATION

There were three primary public health and environmental objectives developed for the UCP site:

- Adequately protect the public against contact with and ingestion of contaminated groundwater.
- Mimimize threats from and adequately protect the environment against the spread of contaminated groundwater.
- Adequately protect the public against contact with and ingestion of contaminated soil and sediments.

The Feasibility Study identified response actions and remedial technologies which consist of source control measures, migration control measures, and other measures. These response actions and remedial technologies are listed in Table 2.

These response actions and remedial technologies were then assembled into twelve potential remedial action alternatives. These alternatives are listed in Table 3. A brief description of each alternative is presented below:

Alternative 1: No Action

By taking no action to clean up the site, contaminants in the soil and the unconfined groundwater zone will continue to migrate from the site and contaminate the confined aquifer.

Continued migration in the unconfined groundwater zone will result in the broadening of the contaminant plume above the confining clay bed--primarily in the direction of the flow gradient (northeast). There are two primary concerns with such an occurrence. First, the confining clay bed is not well defined outside the immediate site area. Continuity, thickness, and permeability of the confining clay bed both within and without the investigation area may vary significantly from that defined during the remedial investigation. Since confining layer continuity, thickness, and permeability determine the rate that contaminants will leak to the aquifer, potential exists for significantly higher leakage rates outside the site area.

Second, analysis of water table contours suggests that there may be significant groundwater discharge from the upper unconfined zone into the local drainage ditch system. The water table seasonally rises above the flow line of the ditch system. The significance of this discharge as a source of surface water contamination has not been established. Elevated total chromium concentrations (up to 55 mg/l) have been monitored in the drainageways. However, the source of this contamination has not been confirmed.

There are two recognized sources of surface water contamination, other than the potential groundwater discharge:

- Roof and site drainage from the United Chrome building area, and
- Contaminated sediment in the drainageways--probably from the foregoing.

The relative significance of groundwater discharge as a source of surface water contamination in unknown, but continued migration of contaminants in the upper unconfined zone may cause it to increase.

RESPONSE ACTIONS AND TECHNOLOGIES

SOURCE CONTROL MEASURES

Excavation of contaminated soils
- o Offsite disposal
- o Onsite landfill disposal

Containment
- o Capping
- o Vertical barriers
- o Bottom barriers
- o Stabilization/solidification

Treatment
- o Soil flushing
- o Chemical reduction
- o Biological treatment

MIGRATION CONTROL MEASURES

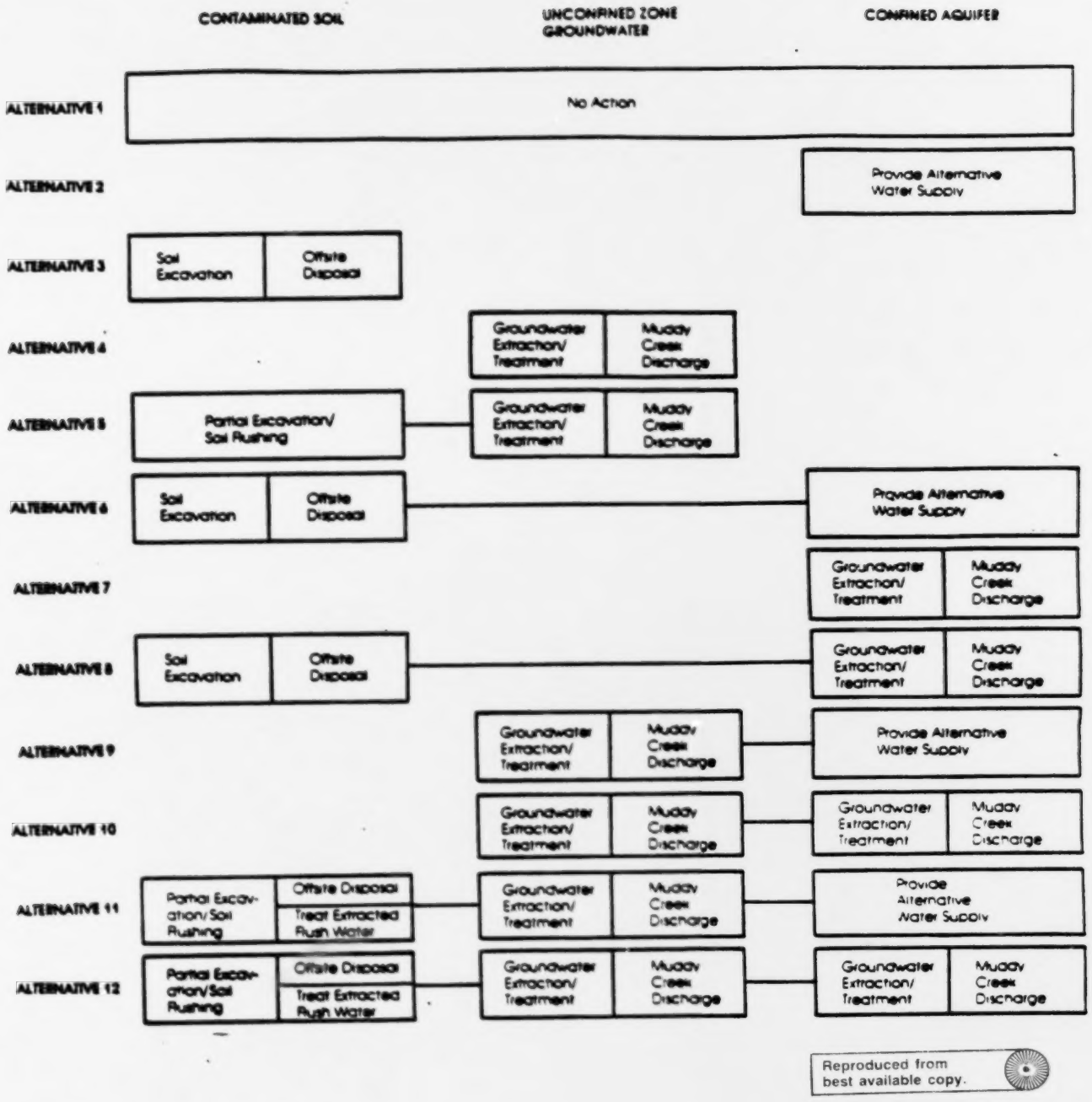
Containment

Groundwater extraction
- o Disposal of extracted groundwater
  - Surface stream discharge
  - Discharge to Corvallis POTW
  - Disposal to a permitted facility
  - Aquifer recharge
  - Land application

Treatment
- o In situ treatment
- o Treatment of extracted groundwater

OTHER MEASURES

Provide alternative drinking water supply
- o Extend city water distribution system
- o Construct new well(s)



Reproduced from best available copy.

TABLE 3
ASSEMBLED ALTERNATIVES
UNITED CHROME FS

Alternative 2: Alternative Water Supply

As an adjunct to Alternative 1 (No Action), new water supply wells could be installed outside the bounds of the current or future aquifer contaminant plume to replace the two existing city wells and provide assurance of a water supply free of chromium contamination. Groundwater would be pumped from the new wells to the existing water storage and distribution system serving the airport area.

Chromium concentrations in water pumped from the city wells are currently at background levels, within drinking water standards and do not presently appear to be at risk from the United Chrome site. However, an ongoing monitoring plan could be established which would require regular sampling and analysis of city well water. Increased levels would trigger use of an alternate water supply. Such a contingency plan would function as a safeguard against potential unknowns.

Alternative 3: Soil Excavation

This alternative consists of excavating and removing highly contaminated unsaturated soil from the site. The soil would be disposed of at the Arlington, Oregon, hazardous waste disposal facility or an equivalent facility. The two areas of contaminated soil are under the concrete floor of the building near the plating bath tanks and the dry well disposal area outside the building. Total chromium levels in these two source areas have been measured as high as 25,900 mg/kg and 162,580 mg/kg, respectively. A portion of the concrete floor would have to be removed. Excavation would be down to the water table, or a maximum of approximately 9 feet.

Alternative 4: Unconfined Zone Groundwater Extraction

Alternative 4 consists of extraction of contaminated groundwater from the unconfined zone, followed by treatment and off-site disposal.

The groundwater extraction system would consist of a grid of extraction wells placed in the contaminated zone, down 15 to 20 feet to the confining clay bed. Wells would be placed so that their influence extended to include all contaminated areas including a portion of the area under the United Chrome building. This alternative is expected to entail long-term pumping from the upper unconfined zone because the source areas (highly contaminated soil) will serve as continuing sources of contamination.

Alternative 5: Soil Flushing/Unconfined Zone Groundwater Extraction

This alternative consists of flushing contaminated soil in the two source areas to remove soluble contaminants, and extraction of contaminated groundwater from the unconfined zone. These two remedial activities complement each other to remove all sources of confined aquifer contamination.

Soil flushing would consist of excavating to a depth of approximately 1 to 2 feet in each source area and continuously applying flush water to the excavated areas. Recovered elutriate would be treated along with the contaminated groundwater extracted from the rest of the unconfined zone and disposed of off-site. This remedial action would require a grid of recovery wells as described in Alternative 4.

Alternative 6: Soil Excavation/Alternate Water Supply

This alternative consists of excavation and removal of highly contaminated soil (Alternative 3) combined with constructing new supply wells to serve the airport area (Alternative 2). Removal of the contaminant source areas by excavation will not assure protection of the confined aquifer because of the threat from remaining contamination in the unconfined groundwater zone. This alternative assures that an uncontaminated water supply is available to the airport area should the ongoing unconfined zone contamination result in the contamination of the existing city wells.

Alternative 7: Confined Aquifer Extraction

This alternative consists of pumping the confined aquifer to extract existing contamination and control migration within the aquifer. A series of extraction wells would be placed into the confined aquifer contaminant plume for pumping. The extraction wells would be located so their influence included all contaminated areas in the aquifer. Extracted groundwater would be pumped to an onsite treatment system followed by discharge offsite.

Pumping from the confined aquifer would be at significantly higher rates than for pumping from the upper unconfined zone (Alternative 4) because of higher aquifer permeabilities. With all contamination remaining in place above the confined aquifer, the pumping system would have to operate over a long period, perhaps up to 30 years, while the upper contamination gradually disperses.

Alternative 8: Soil Excavation/Confined Aquifer Extraction

Alternative 8 consists of excavation and removal of highly contaminated soil (Alternative 3) combined with pumping of the confined aquifer (Alternative 7) to prevent spread of contamination in the aquifer while contamination in the unconfined zone naturally disperses over time.

Soil excavation, removal, and disposal would be the same as described for Alternative 3. In addition, as described in Alternative 7, a series of wells would be installed into the confined aquifer contaminant plume for pumping. The extraction wells would be located so their influence included all contaminated areas in the aquifer. Extracted water would be treated and disposed of off-site.

Alternative 9: Unconfined Zone Groundwater Extraction/Alternate Water Supply

Alternative 9 consists of extracting contaminated groundwater from the unconfined zone (Alternative 4) combined with constructing new supply wells to serve the airport area (Alternative 2). This alternative would provide cleanup of the unconfined groundwater to eliminate discharge of contaminants to nearby surface ditches and prevent leakage of contaminants to the confined aquifer, and would also assure an uncontaminated water supply for the airport area at all times.

Alternative 10: Unconfined Zone Groundwater Extraction/Confined Aquifer Extraction

Alternative 10 consists of extracting contaminated groundwater from the unconfined zone (Alternative 4) combined with pumping of the confined aquifer (Alternative 7). Extracting water from the unconfined zone will eliminate discharge of contaminants to nearby surface ditches and prevent leakage of contaminants to the confined aquifer. Extracting water from the contaminant plume in the confined aquifer will reduce and control migration within the aquifer. All extracted water would be treated and disposed of off-site.

Alternative 11: Soil Flushing/Unconfined Zone Groundwater Extraction/Alternate Water Supply

This alternative is a combination of Alternatives 5 and 2. In addition to cleaning up the contaminated soil source areas and the contaminated unconfined zone groundwater, it also provides an uncontaminated water supply to the airport area.

Alternative 12: Soil Flushing/Unconfined Zone Groundwater Extraction/Confined Aquifer Extraction

Alternative 12 is a combination of Alternatives 5 and 8. It provides the most complete restoration of the site to pre-United Chrome conditions. Soil flushing and groundwater extraction from the unconfined zone and the confined aquifer are all remedial actions which would remove contaminants from the site. All extracted water would be treated and then disposed of off-site.

Section 300.68(f) of the National Contingency Plan (NCP) requires that, to the extent possible, at least one remedial alternative will be developed for each of the following five categories:

1. Alternatives that treat or dispose of hazardous substances at an off-site facility. Such a facility must be in compliance with all applicable EPA standards.

2. Alternatives that attain applicable or relevant federal public health or environmental standards, guidance, or advisories.

3. Alternatives that exceed applicable or relevant federal public health or environmental standards, guidance, or advisories.

4. Alternatives that prevent or minimize present or future migration of hazardous substances and protect human health and the environment, but do not attain the applicable or relevant federal public health or environmental standards, guidance, or advisories.

5. No action.

Table 4 presents the alternatives in the Feasibility Study which satisfy this requirement.

The twelve alternatives were subjected to an initial screening to eliminate the least suitable alternatives and narrow the list of potential remedial actions for further detailed analysis. Three broad criteria were used:

- Technical feasibility. Technical feasibility includes: 1) a general assessment of whether the technologies are feasible for the site condition and are applicable to groundwater contamination, and 2) a general assessment of the alternative's reliability in addressing the groundwater contamination.

- Environmental and public health impacts. The evaluation of environmental and public health impacts addressed the effectiveness of the alternative in protecting the public health, welfare, and the environment.

- Costs. Relative costs were developed for each alternative. The cost estimates are conceptual (-50 to +100 percent) and reflect relative rather than absolute costs because elements common among alternatives performing the same remedial function may not be included. These estimates are not intended to represent construction costs.

The results of the initial screening are summarized in Table 5.

TABLE 4

REMEDIAL ACTION CATEGORIES FOR ALTERNATIVES

Remedial Action Category	Alternative	Comments
1. Treat or dispose of hazardous substances at an offsite facility.	Alternative 3: Soil excavation.	Contaminated soil sent to Arlington or an equivalent facility.
	Alternative 6: Soil excavation/ alternate water supply.	Contaminated soil sent to Arlington or an equivalent facility.
	Alternative 8: Soil excavation/ confined aquifer extraction.	Contaminated soil sent to Arlington or an equivalent facility.
2. Attain applicable or relevant federal public health or environmental standards.	Alternative 5: Soil flushing/ unconfined zone groundwater extraction.	Cleanup contaminated soil and unconfined zone to protect confined aquifer.
3. Exceed applicable or relevant federal public health or environmental standards.	Alternative 11: Soil flushing/ unconfined zone groundwater extraction/alternate water supply.	Cleanup contaminated soil and unconfined zone to protect confined aquifer; provide new water supply.
	Alternative 12: Soil flushing/ unconfined zone groundwater extraction/confined aquifer extraction.	Cleanup contaminated soil and unconfined zone to protect confined aquifer; pump aquifer to protect city wells.
4. Prevent or minimize present or future migration of hazardous substances and protect human health and the environment, but do not attain the applicable or relevant federal public health or environmental standards.	Alternative 2: Alternative water supply.	Does not prevent present or future migration of contaminants.
	Alternative 3: Soil excavation.	Does not protect aquifer from contamination.
5. No action.	Alternative 1: No action.	Does not prevent present or future migration of hazardous substances or protect human health and the environment.

INITIAL SCREENING SUMMARY

Alternative	Technical	Environmental and Public Health	Estimated Cost ($)
1. No action	o	--	0
2. Alternative Water Supply	o	-	200,000
3. Soil Excavation	+	o	600,000
4. Unconfined Zone Groundwater Extraction	+	+	1,700,000
5. Soil Flushing/Unconfined Zone Groundwater Extraction	++	++	1,700,000
6. Soil Excavation/Alternate Water Supply	o	+	800,000
7. Confined Aquifer Extraction	0	+	2,000,000
8. Soil Excavation/Confined Aquifer Extraction	+	+	2,500,000
9. Unconfined Zone Groundwater Extraction/Alternate Water Supply	+	+	2,300,000
10. Unconfined Zone Groundwater Extraction/Confined Aquifer Extraction	++	+	2,700,000
11. Soil Flushing/Unconfined Zone Groundwater Extraction/Alternate Water Supply	++	++	1,900,000
12. Soil Flushing/Unconfined Zone Groundwater Extraction/ Confined Aquifer Extraction	++	++	2,700,000

-- Extremely negative effects.

- Negative effects, but not great enough to be sole justification for eliminating an alternative.

o No change from existing conditions, or very little positive or negative effects.

+ A positive or moderately positive benefit.

++ An extremely positive benefit.

Alternatives 6, 9, and 11 were eliminated because they consist of remedial cleanup measures designed to protect the confined aquifer, in addition to providing a new alternative water supply which negates the necessity for aquifer protection. Alternative 7 was dropped from further consideration because it has no provision to prevent additional contaminants from entering the confined aquifer. It is a passive response targeted to allowing contamination to occur and then removing it. It is likely that extraction (and subsequent treatment and disposal) under this alternative could be required for 30 or more years. Alternative 8 was also eliminated because it has no provision for immediate reduction or prevention of contaminant migration to the confined aquifer. It is likely that operation of this alternative would also be required for a relatively long period of time as contaminated water in the unconfined zone continued to migrate to the confined aquifer.

A more detailed analysis was then conducted of the seven remaining alternatives. This analysis consisted of a technical evaluation which assessed the performance, reliability, implementability, and safety of each alternative. Public health and environmental considerations, institutional considerations, and cost estimates for each alternative were also evaluated. Table 6 summarizes the results of this detailed analysis.

Alternative 1, No Action, was eliminated because it would allow the continued migration of chromium contamination in both the groundwater and surface drainage system. The contaminant plume would continue to spread and could eventually affect the drinking water supply wells at the airport complex. Even if the contaminant plume did not reach the existing production wells at concentrations high enough to endanger public health, it would continue to render an increasingly larger portion of the aquifer around the UCP site unusable. This could potentially lead to future restrictions on the usage of the site, as well as restriction on future well locations and groundwater usage.

Alternative 2, Alternative Water Supply, was eliminated because while it would provide immediate assurance of no contamination from the UCP site entering the airport complex water supply, it would do nothing to mitigate the existing contamination around the site. The potential for continued migration of contamination in the shallow zone, both laterally and into the deeper production aquifer would remain as would the potential for future land use and groundwater restriction under the No Action alternative.

Alternative 3, Soil Excavation, was eliminated for several reasons. Because of the extensive area contamination, excavation would be limited to the most highly contaminated soils near the dry well and the plating tanks. Contaminated soils outside the areas being excavated would continue leaching and remain as ongoing sources of groundwater contamination. Also, the 1984 Hazardous and Solid Waste Amendments to RCRA state in Section 1002(b)(7) that "reliance on land disposal should be minimized or eliminated, and land disposal, particularly landfill and surface impoundment, should be the least favored method for managing hazardous wastes."

TABLE 6

SUMMARY OF DETAILED EVALUATIONS

	Alternative						
	1	2	3	4	5	10	12
Technologies Included							
Alternate Water Supply	NA	P	NA	NA	NA	NA	NA
Soil Excavation	NA	NA	P	NA	NA	NA	NA
Soil Flushing	NA	NA	NA	NA	P	NA	P
Unconfined Zone Groundwater Extraction	NA	NA	NA	P	P	P	P
Confined Aquifer Extraction	NA	NA	NA	NA	NA	P	P
Extracted Water Treatment	NA	NA	NA	P	P	P	P
Performance (Effectiveness)							
Eliminates Potential Exposure to Contaminated Soil	N	N	P	N	P	N	P
Assures Safe Local Water Supply	N	P	N	P	P	P	P
Removes Contamination From Unconfined Zone	N	N	N	P	P	P	P
Removes Contamination From Confined Aquifer	N	N	N	N	N	P	P
Extracted Water Adequately Treated for Discharge	NA	NA	NA	P	P	P	P
Reliability							
New Supply Wells	NA	P	NA	NA	NA	NA	NA
Excavation	NA	NA	P	NA	NA	NA	NA
Extraction Wells	NA	NA	NA	P	P	P	P
Soil Flushing	NA	NA	NA	NA	O	NA	O
O&M Requirements	P	P	P	N	N	N	N

TABLE 6
(continued)

	Alternative						
	1	2	3	4	5	10	12
Implementability							
Easily Installed with Conventional Equipment	NA	P	P	P	P	P	P
Total Time to Implement	NA	P	P	N	N	N	N
Safety (During Implementation)							
Requires Worker/Operator Protection	NA	P	N	N	N	N	N
Public Health and Environmental Considerations							
Potential Human Exposure During Implementation	NA	P	N	N	N	N	N
Assures Safe Water Supply	NA	P	N	P	P	P	P
Provides Some Degree of Site Restoration	N	N	P	P	P	P	P
Institutional Considerations							
Complies with RCRA	NA	NA	P	P	P	P	P
Complies with CWA	NA	NA	NA	P	P	P	P
Complies with GWPS	N	N	N	P	P	P	P
Cost							
Capital cost ($ in thousands)	0	172	599	929	1,063	1,452	1,580
Present Worth ($ in thousands)	0	172	599	1,745	1,699	2,724	2,570

NOTE: NA = Not Applicable
P = Positive Aspect
N = Negative Aspect
0 = Neutral (neither positive nor negative) aspect
CWA = Clean Water Act
GWPS = Groundwater Protection Strategy
RCRA = Resource Conservation and Recovery Act

Alternative 4, Unconfined Zone Groundwater Extraction, was eliminated because while it would reduce contamination in the shallow groundwater, it would not provide for any cleanup of the contaminated soils in the source areas nor the contaminated groundwater in the lower production aquifer. Also, this alternative would allow the continued migration of the contaminated groundwater in the lower zone. While this might not immediately impact the existing airport production wells, it would render an increasingly larger portion of the production aquifer around the UCP site unusable. Again, this could lead to future land use and groundwater restrictions.

Alternative 5, Soil Flushing and Unconfined Zone Groundwater Extraction, was eliminated for the same reasons as Alternative 4. While this alternative did address the reduction of contamination in the unsaturated soil above the shallow groundwater, it did not include any treatment of the contaminated groundwater in the deeper production aquifer beneath the site. The Feasibility Study concluded that the combined efforts of Alternative 5 would reduce the migration of chromium into the lower production aquifer to a level that would ensure that the Primary Drinking Water Standard of 0.05 mg/l could be maintained at the nearest production well some 3000 feet away. The study predicted, however, that the natural attenuation of the existing contamination in the lower aquifer might still result in chromium levels above the drinking water standard nearly 1500 feet from the site. Thus, all of the groundwater within that area might ultimately be rendered unusable. After considerable evaluation of this alternative, EPA and ODEQ determined that allowing the continued degradation of this production aquifer would be unacceptable.

Alternative 10, Unconfined Zone and Confined Aquifer Groundwater Extraction, is similar to Alternative 4 with the addition of a second deep well system to extract the contaminated groundwater from the production aquifer. While this alternative does address the cleanup of the lower zone, it does not include any treatment or removal of the contaminated soil in the unsaturated zone above the shallow groundwater table. As in Alternative 4, this contaminated soil would remain as a potential source of future groundwater contamination. For this reason Alternative 10 was eliminated.

Table 7 presents a summary of the cost estimates for the alternatives examined in the detailed analysis.

COMMUNITY RELATIONS

There was a public comment period on the Remedial Investigation and Feasibility Study reports from August 19 through September 9, 1985. Copies of the reports were available for review at the Benton County Health Department and at the Corvallis Library. A public meeting was held on August 21 at the Public Service Building in Corvallis. Notices of the

COST ESTIMATE SUMMARY FOR REMEDIAL ACTION ALTERNATIVES

Alternative	Estimated Costs (1985) Capital	Annual O&M	Present Worth
2--Alternative Water Supply	$ 172,000	none	$ 172,000
3--Soil Excavation	599,000	none	599,000
4--Unconfined Zone Groundwater Extraction	929,000	$168,000	1,745,000[a]
5--Soil Flushing/ Unconfined Zone Groundwater Extraction	1,063,000	168,000	1,699,000[b]
10--Unconfined Zone and Confined Aquifer Groundwater Extraction	1,452,000	261,000	2,724,000[a]
12--Soil Flushing/ Unconfined Zone and Confined Aquifer Groundwater Extraction	1,580,000	261,000	2,570,000[b]

[a] 7 years; 10 percent interest.

[b] 5 years; 10 percent interest.

meeting and public comment period were sent out to 44 nearby residents, businesses, elected officials, city and county agencies and local news media. Eighteen people attended the public meeting. Comments were received from the Sierra Club, the League of Women Voters of Corvallis, the city of Corvallis, and ODEQ. A more detailed discussion of the comments and agency responses is included in the attached Responsiveness Summary.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

All facets of the proposed Remedial Alternative will be consistent with the technical requirements of other environmental laws. The off-site transportation and disposal of the excavated soil will be in accordance with applicable RCRA regulations, including manifesting of wastes and shipment to a RCRA-permitted land disposal facility. All off-site disposal shall be in compliance with the policies stated in the Procedure for Planning and Implementing Off-Site Response Actions as published in the Federal Register, Volume 50, Number 214, November 5, 1985.

An NPDES permit will be obtained for the treated effluent discharge to Muddy Creek. This discharge will be monitored to ensure that the Willamette River basin standard for chromium of 0.02 mg/l is maintained throughout the year.

RECOMMENDED ALTERNATIVE

The recommended alternative is number 12 which would consist of unconfined zone and confined aquifer groundwater extraction, treatment, and surface discharge. This alternative would also include the limited excavation of contaminated soil from the dry well and plating tank areas for the purpose of constructing two percolation basins. As a part of this excavation, the plating tanks and any residual sludge contained in them, would be removed and either recycled or disposed of at a RCRA-permitted land disposal facility. These basins would be used to flush the contaminated soil in the unsaturated zone above the shallow groundwater table. In addition, the open drainage ditch within the contaminated area would be culverted to protect the local surface drainage ditch system from contamination.

The objective of this alternative is to remove contamination in the confined aquifer and control the migration of further contamination from the upper unconfined zone. Until the upper zone is cleaned up, it will continue to seep contamination through the confining clay bed into the underlying aquifer.

The cleanup criteria for the confined aquifer is 0.05 mg/l chromium, the drinking water standard, because this aquifer is considered a drinking water source and in direct hydraulic connection to the local drinking water supply wells.

The cleanup criteria for the unconfined zone is 10 mg/l chromium. This concentration represents the minimum cleanup required to protect the local drinking water supply. The drinking water standard of 0.05 mg/l chromium was not used because the unconfined zone is not used as a drinking water source anywhere in the area, and because the present level of contamination would likely make it technologically or economically infeasible to achieve this standard.

The contaminated groundwater will be extracted from the two zones by a system of approximately fifteen shallow wells and five deep wells as shown in Figures 5 and 6.

The groundwater extracted from both zones will be treated to reduce the chromium concentration to an acceptable level for surface water discharge. The proposed treatment process is shown schematically in Figure 7. It could be constructed using vendor-supplied, skid-mounted package units so that with a minor amount of engineering, interconnecting piping and wiring, the total system could readily be operable.

The extracted groundwater would be pumped to an influent holding tank and then transferred to a chemical reduction tank where the hexavalent chromium would be reduced to the trivalent state. The groundwater containing reduced trivalent chromium would then flow to a pH adjustment tank to elevate the pH to between 9 and 10. At this pH, metals present in the groundwater will precipitate out as hydroxides. The groundwater would then flow to a flocculation tank where a polymer solution would be added to enhance settling of the precipitate. From the flocculation tank the water would flow to a clarifier for settling. A treated effluent concentraton of 0.3 to 0.4 mg/l chromium is expected.

The settled sludge would be periodically drawn from the bottom of the clarifier. At the present time, it is assumed that this sludge will be a hazardous waste and must be disposed of at a RCRA-permitted facility.

The treated effluent would be pumped through a buried pipeline to Muddy Creek for discharge as shown in Figure 8. The creek provides a minimum of a 10 to 1 dilution of the 50,000 gallon per day effluent flow based on available minimum summer flow data. If, for any reason, the treated groundwater should not meet the desired water quality, transportation by truck and disposal at the Corvallis wastewater treatment plant could be used as a temporary alternative.

The estimated total capital cost of this alternative is $1,580,000 and the total annual operating cost is $261,000. A more detailed summary of the estimated costs is presented in Table 8.

The UCP Feasibility Study was structured to meet the requirements of the revisions to the NCP (Federal Register, Volume 47, Number 137, July 16, 1982), and also EPA's "Guidance on Feasibility Studies Under CERCLA" (EPA/540/G-85/003 June 1985). Alternatives were developed to address the five Remedial Action categories specified in the guidance (Table 4).

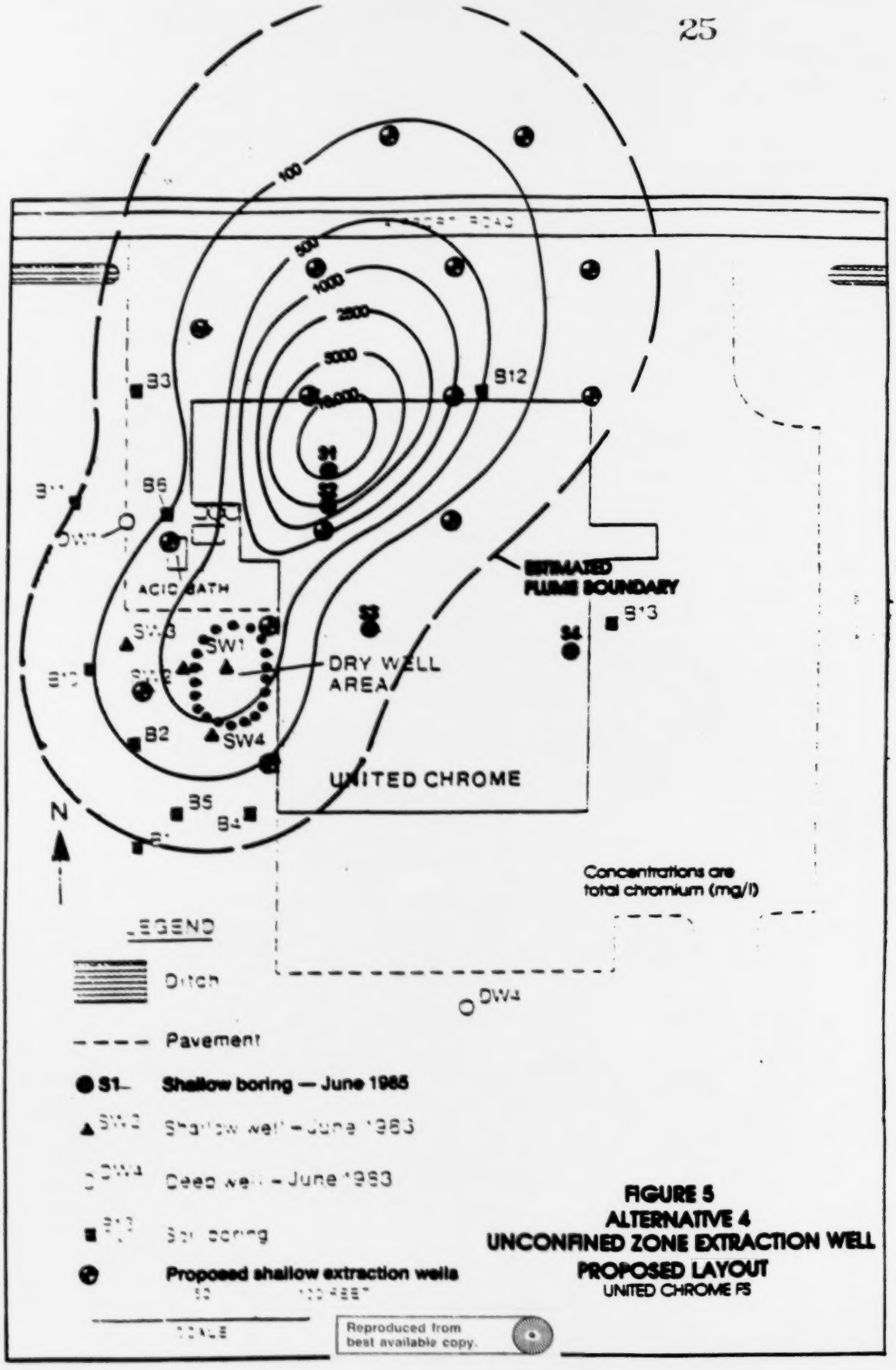


FIGURE 5
ALTERNATIVE 4
UNCONFINED ZONE EXTRACTION WELL
PROPOSED LAYOUT
UNITED CHROME FS

Reproduced from best available copy.

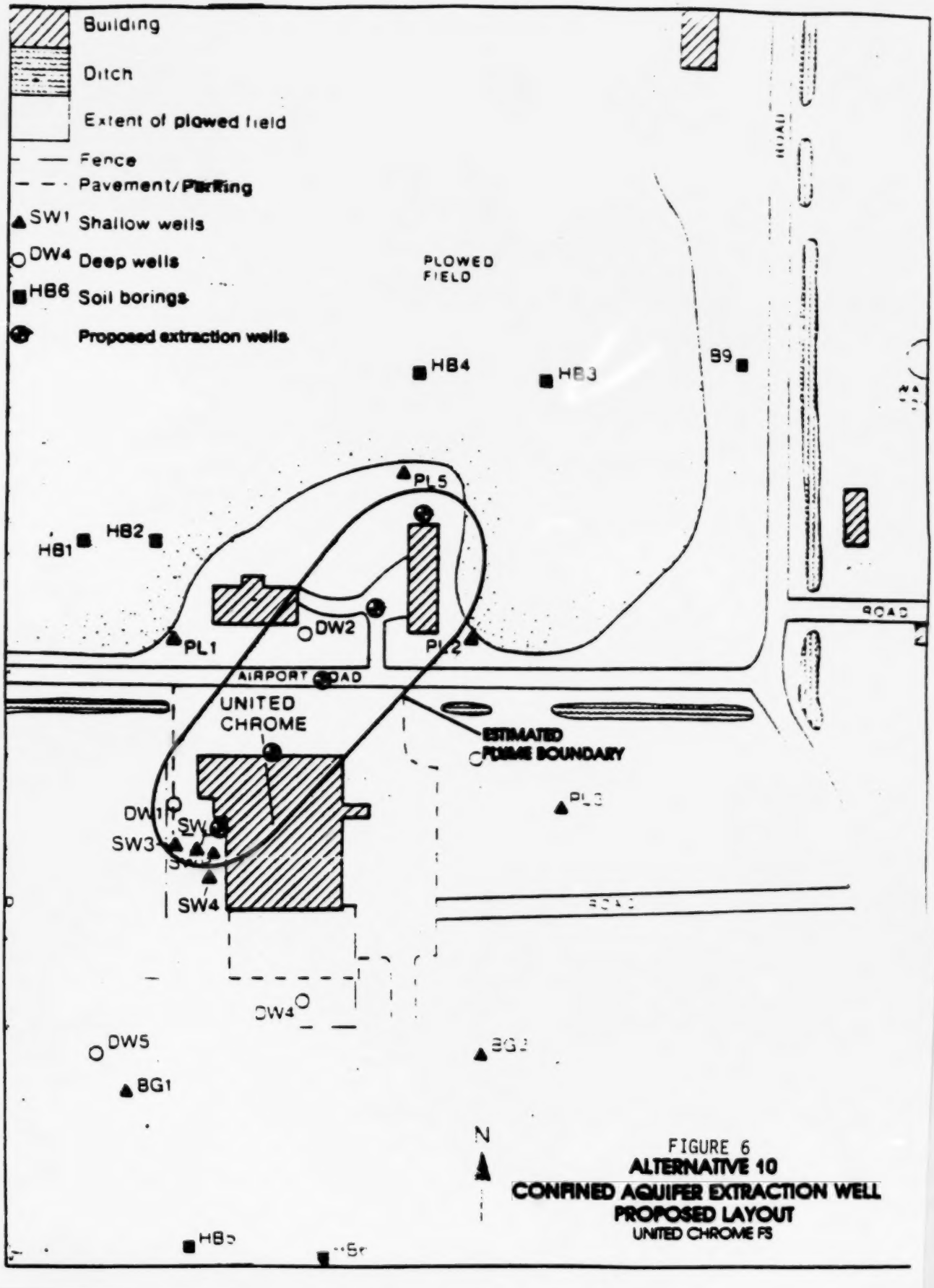
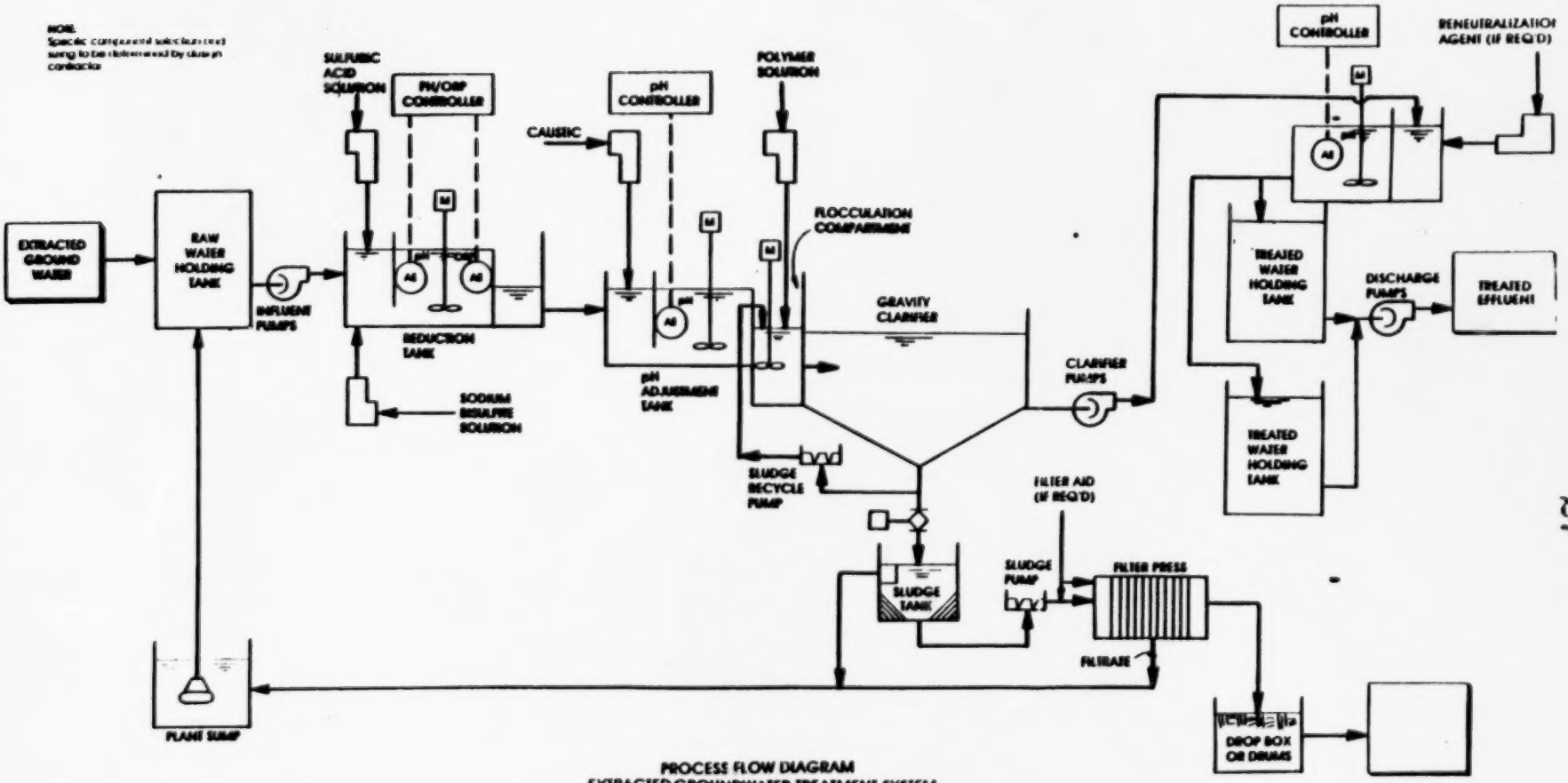


FIGURE 6
ALTERNATIVE 10
CONFINED AQUIFER EXTRACTION WELL
PROPOSED LAYOUT
UNITED CHROME FS



PROCESS FLOW DIAGRAM
EXTRACTED GROUNDWATER TREATMENT SYSTEM
UNITED CHROME FS

FIGURE 7

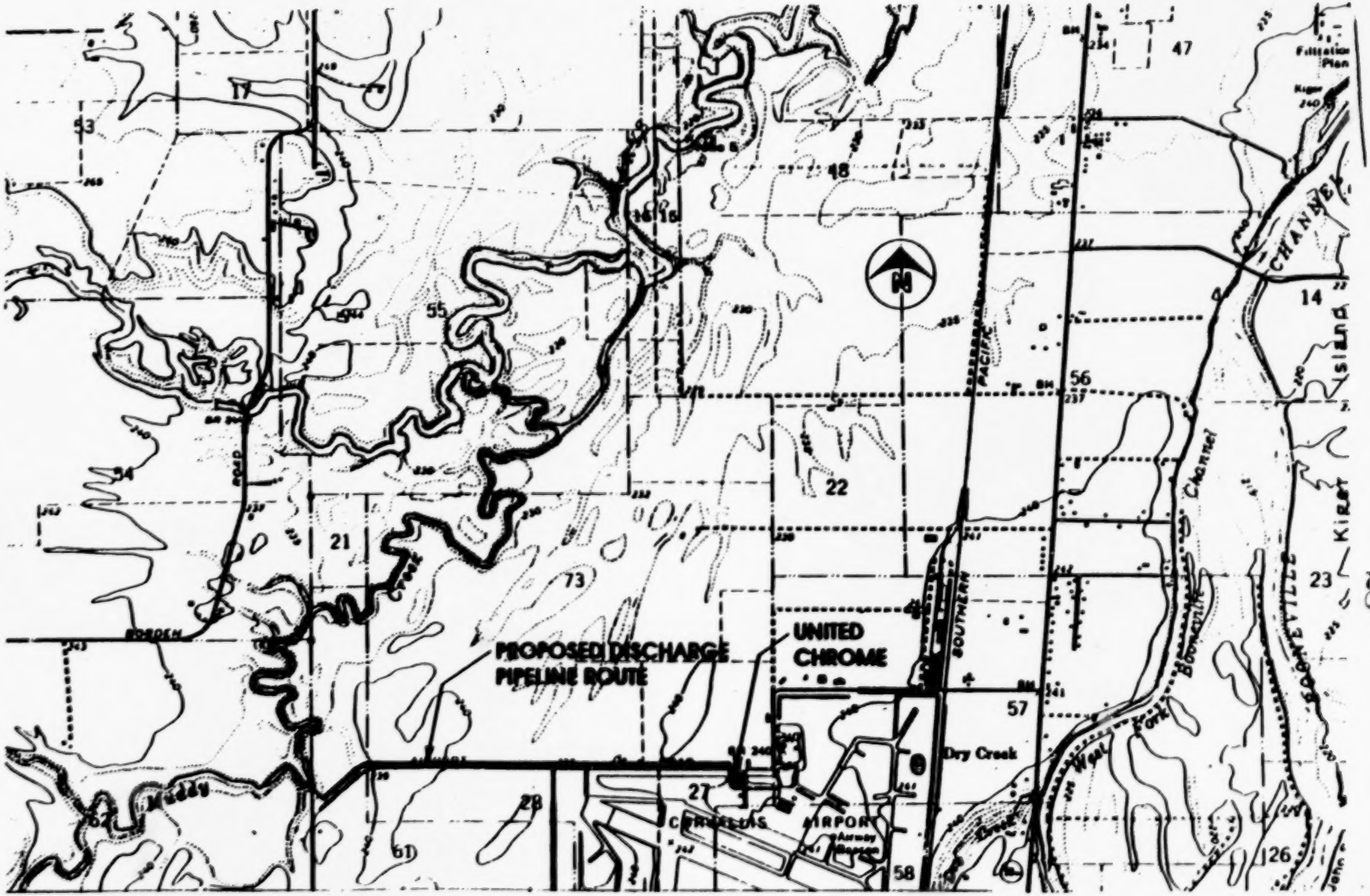


FIGURE 8
PROPOSED DISCHARGE ROUTE
TO MUDDY CREEK
UNITED CHROME FS

TABLE 8

COST SUMMARY
ALTERNATIVE 12: SOIL FLUSHING/UNCONFINED ZONE AND CONFINED AQUIFER GROUNDWATER EXTRACTION

Capital Cost Items	Estimated Cost
General Mobilization, Bonding, Insurance Health and Safety Program Equipment Decontamination Equipment Demobilization	$ 51,000
Unconfined Zone Groundwater Extraction	46,000
Confined Aquifer Groundwater Extraction	24,000
Onsite Wastewater Treatment	682,000
Effluent Disposal	137,000
Demolition	32,000
Soil Excavation/Disposal	48,000
Soil Flushing	3,000
Surface Drainage	10,000
Construction Subtotal	1,033,000
Bid Contingencies (15%)	155,000
Scope Contingencies (15%)	155,000
Construction Total	1,343,000
Permitting and Legal (3%)	31,000
Services During Construction (10%)	103,000
Total Implementation Cost	1,477,000
Engineering Design (10%)	103,000
TOTAL CAPITAL COST	$1,580,000

Annual Operating Cost Items	Estimated Annual Cost
Administration	$ 42,000
Operations	96,000
Maintenance	36,000
Disposal	20,000
Sample Analysis	24,000
O&M Subtotal	218,000
Contingencies (20%)	43,000
TOTAL ANNUAL OPERATING COST	$ 261,000
PRESENT WORTH (5 years; 10% interest)	$ 991,000
TOTAL PROJECT COST	$2,570,000

At that time, the applicable standard used in these alternatives was the Safe Drinking Water Act Maximum Contaminant Level for chromium (0.05 mg/l). This standard was to be applied at the nearest existing receptor point, the city of Corvallis drinking water wells approximately 3000 feet to the northeast. With this objective, Alternative 5 was the preliminary choice for the cost-effective alternative at the time of the public meeting.

However, the ODEQ commented on the Feasibility Study stating that the Oregon Groundwater Quality Protection Policy could not allow the loss of beneficial use of the production aquifer that would occur with Alternative 5. While Alternative 5 would ensure meeting the drinking water standard for chromium at the city wells, it would allow the contamination in the aquifer near the site to attenuate naturally over time. This would ultimately result in long-term degradation of the aquifer as far as 1500 feet downgradient of the site, with chromium concentrations exceeding the drinking water standard. ODEQ stated further that the goal should be to meet the drinking water standard at the plant site boundary.

Upon review of these comments, and those of the city of Corvallis and several citizens' organizations, EPA agrees that the drinking water standard should be met at the plant site boundary. This position is consistent with the groundwater protection provisions of RCRA (40 CFR 264 Subpart F); in particular, Section 264.92 that the chromium standard of 0.05 mg/l should not be exceeded in the uppermost aquifer underlying the site beyond the "point of compliance". Section 264.95 defines this point of compliance as a vertical surface located at the hydraulically downgradient limit of the site that extends down into the uppermost aquifer underlying the site. Further, Section 264.100(b) states that a corrective action program must be implemented to prevent hazardous elements (in this case, chromium) from exceeding their respective concentration limits at the compliance point by removing them or treating them in place.

This position is also consistent with EPA's Ground Water Protection Strategy goal of maintaining the highest beneficial use of Class II aquifers. Finally, we believe this decision is closer to our understanding of what Congress' intent is for the pending reauthorization of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).

Given these objectives, EPA has determined that Alternative 12 is the only alternative which will attain the applicable standard at the plant site boundary. No other alternative would sufficiently address both the public health and environmental concerns.

OPERATION AND MAINTENANCE (O&M)

The proposed treatment system was described in the preceding section. It relies primarily on chemical reduction and precipitation technology that is widely used for the treatment of hexavalent chromium wastewaters in the metal plating industry. The performance history is good. Although the proposed process has continuous operation, it includes holding tanks for production for two full days. This allows daily testing of process water to help insure maximum reliability.

The operation and maintenance activities for the groundwater extraction system and the on-site groundwater treatment system would include:

- process operation
- chemical feed management
- routine maintenance of pumps and other mechanical equipment such as the filter press and chemical mixer motors
- sampling and analysis of extracted groundwater and treated effluent
- sludge management - handling and final disposal

The estimated annual operating costs are set forth in Table 8. The time required to achieve cleanup is estimated at five years with a possible range of three to eight years.

The Emergency Board of the Oregon Legislature has approved $1,116,000 which represents the state's cost share of the total remedial investigation, feasibility study, design, construction, and first year operation and maintenance costs for this site. EPA funding of future activities at UCP is pending the reauthorization of Superfund. Under the present law, the federal share of the costs would be fifty percent (50%). EPA funding for operation and maintenance costs is anticipated to cover the first year after the completion of construction.

SCHEDULE

The key milestones and dates for project implementation are as follows:

• Approve Remedial Action (sign ROD)	September 1986
• Superfund State Contract	September 1986
• Initiate Work Assignment for Design	October 1986
• Complete Design	March 1987
• Superfund State Contract for Construction	April 1987
• Start Construction	May 1987
• Complete Construction	September 1987

At this time, EPA anticipates funding the design portion of this project through an advance match using state funds. However, the initiation of construction activities will depend on the reauthorization of Superfund and federal funds being available to complete the project.

FUTURE ACTIONS

No additional remedial activities are planned at this time. After completion of construction the only activity will be the operation and maintenance of the groundwater extraction and treatment systems, and performance monitoring.

UNITED CHROME PRODUCTS, INC.
CORVALLIS, OREGON

RESPONSIVENESS SUMMARY

OVERVIEW

At the public meeting held on August 21, 1985, the Environmental Protection Agency (EPA) presented Alternative 5 from the Feasibility Study as the preferred remedial alternative. This alternative would have addressed the original primary objective of protecting the existing drinking water wells at the airport complex. There was very little comment from the general public on this proposal. However, after review and discussion of the alternatives, the Oregon Department of Environmental Quality (ODEQ)) recommended more extensive remedial measures than those provided for in the original proposal. In response, EPA agreed to change to Alternative 12 in the Feasibility Study.

This alternative specified in the Record of Decision (ROD) involves the installation of wells to extract the contaminated groundwater from both the shallow saturated zone and the lower confined aquifer. This groundwater would be treated on site to remove chromium contamination and then discharged to nearby Muddy Creek.

The final alternative more closely addresses the objectives of the state's Groundwater Quality Protection Policy as well as the groundwater protection provisions of Resource Conservation and Recovery Act (RCRA).

BACKGROUND ON COMMUNITY INVOLVEMENT

There has been little community interest in the Remedial Investigation and Feasiblity Study to date. EPA's community relations effort began in November 1984 when the first fact sheet was released on the upcoming investigation. There were no significant comments or questions from the public on this fact sheet or the subsequent field work at the site.

Eighteen people attended the public meeting on August 21, 1985. Twelve of these people were from government agencies, consulting firms, and the media. There were three representatives from two citizens' groups. The remaining three people were from the general public.

The general response from ODEQ, the city of Corvallis, and the Sierra Club was for a more thorough cleanup than that originally favored by EPA. After evaluating all of the comments, and after extensive discussion with ODEQ, EPA revised its position to recommend Alternative 12 from the Feasibility Study as the final alternative.

SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES

The initial comment period was held from August 19 through September 9, 1985, to receive comments from the public on the draft Feasibility Study. The only comments received during this period were from the Sierra Club and the League of Women Voters. The city of Corvallis requested a short extention of the comment period so that the City Council could review the alternatives. The city provided comments to EPA on October 23, 1985. The ODEQ requested an indefinite extention of the comment period to conduct an extensive examination of the alternatives and their relationship to the state environmental statutes and policies. EPA received the initial ODEQ comments on December 23, 1985. Numerous discussions and meetings between EPA and ODEQ were conducted over the next several months culminating in ODEQ providing to EPA a preliminary recommendation of Alternative 12 on May 19, 1986.

The comments received on the draft Feasibility Study alternatives and the EPA responses are summarized below:

1. The League of Women Voters of Corvallis wrote asking that the public comment period be extended thirty days. In response to this request and those of the state and the city of Corvallis, EPA extended the comment period indefinitely. This indefinite extension was possible because of the project slowdown caused by the delay of the reauthorization of Superfund. An article in the September 5, 1985, edition of the Corvallis Gazette-Times noted this extension.

2. The Marys Peak Group of the Sierra Club wrote supporting a combination of Alternatives 3 and 5. While EPA ultimately supported a more extensive cleanup than originally proposed, it did not include the additional excavation in Alternative 3. This is primarily because of Congress' intent in the Hazardous and Solid Waste Amendments of 1984 to make land disposal the least-favored remedial alternative.

3. The city of Corvallis had four major concerns with the proposed cleanup alternative:

   (1) assurance of a safe drinking water supply for the airport facilities;

   (2) the environmental impact of the discharge of process water to Muddy Creek;

   (3) the disposition of the United Chrome Products building during and after the cleanup process; and

   (4) clarification of the cleanup goal and how the most appropriate alternative is selected.

EPA believes that the implementation of Alternative 12 will adequately address the concern of contamination in the production aquifer. The extraction of contaminated groundwater from this aquifer near the site should prevent any further migration toward the current city production wells some 3000 feet away. Several monitoring wells are in place between the site and the city wells which would detect any contamination migration long before it would affect the city wells.

The discharge of process water to Muddy Creek will be closely evaluated during the design of the remedial alternative. Extensive monitoring will be conducted to ensure that National Pollution Discharge Elimination System discharge permit standards will be met at all times. The design of the treatment system calls for a holding tank sized for two days' production. This holding time will allow for proper process monitoring of the final effluent prior to discharge, thus providing a safeguard against treatment process equipment failure.

The final disposition of the United Chrome Products building is undecided at this time. The city has indicated in their comments to EPA that they have no strong desire to save the building, and would favor its destruction if such action would shorten the cleanup process. During the Remedial Design EPA will direct its consultant to examine the relative costs of cleaning the contaminated portion of the building versus demolishing the building completely. Once these costs are available, a final decision on the building will be made after consultation with the city and ODEQ.

The original cleanup objective was to protect the existing city drinking water wells at the airport complex. Given the input from ODEQ, this objective has now been expanded to include protection of as much of the production aquifer near the site as possible. The goal is to achieve the drinking water standard for chromium of 0.05 milligrams per liter at the downgradient property boundary. EPA and ODEQ now believe Alternative 12 is the only alternative examined which can meet this new objective.

ODEQ's initial comments to EPA in December 1985 were primarily requesting clarification of specific elements of the draft Feasibility Study report. They also requested a more detailed explanation of the procedures in the National Contingency Plan for conducting a Remedial Investigation and Feasibility Study, and for selecting a remedial alternative. Over the next five months, EPA and ODEQ continued discussions on a variety of technical and policy issues regarding this project.

The applicability of Oregon's Groundwater Quality Protection Policy emerged as one of the most important concerns for ODEQ. They finally determined that the state goal would be to attain the drinking water standard for chromium in the confined aquifer at the site boundary. EPA responded by agreeing to revise the original scope of the project to include this objective. It was this change that ultimately led to the selection of Alternative 12 as the preferred remedial alternative.

REMAINING CONCERNS

EPA is not aware of any remaining citizen concerns at this time. A fact sheet will be sent out, after the Record of Decision is signed, describing the upcoming design and remedial action activities. Additional community relations activities will be conducted as interest in the project warrants.